



CITIES
NETWORK



Comune di
Milano

Governance and Multi-benefit approach to Water Management

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— The context

Milan in transition

Nowadays, public administrations face more than ever the so-called *'wicked problems'*, complex and articulated challenges among which climate change stands out.

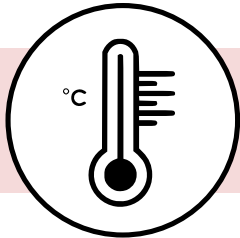
Milan is therefore learning to act in a **practical and tangible way**, through innovative tools and actions to develop a **new framework for growth and development**.

Milan is experiencing a period of profound renewal that has demonstrated the **great level of adaptation of the city**.



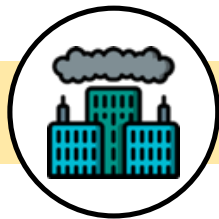
— LOCAL CLIMATE PROFILE: analytical framework

Guidelines for adaptation to climate change



Increase of **temperatures**
Frequency of **heat waves** and **drought**

Frequency of **extreme weather events**
Increase of **groundwater level**



Emissions **CO₂**, **NO₂**, **PM₁₀**, **PM_{2.5}**

Urban Resilience

It is the **ability** of individuals, communities, institutions, businesses to **survive, adapt and grow** regardless of what chronic stress and acute shocks they suffer



— Green and Environment Department

UNITS INVOLVED



Urban Resilience Department



Climate and Energy Area



Water Resources and Environmental Hygiene Area

RESPONSIBLE FOR:

- The implementation of environmental and energy policies;
- Resilience issues;
- Functions in the field of environmental protection and the fight against pollution



— Towards a positive evolution



Equity

To update the positive moment of Milan and extend it to all the **social and registry groups**

Accessibility

Take the opportunity to **expand growth to all neighborhoods**

Re-Naturalization

Improve environmental conditions, urban climate and quality of life

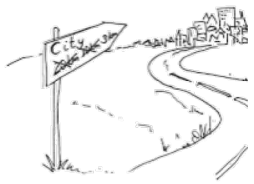
Decarbonization

Implement new development models based on **sustainable energy** to help recovery

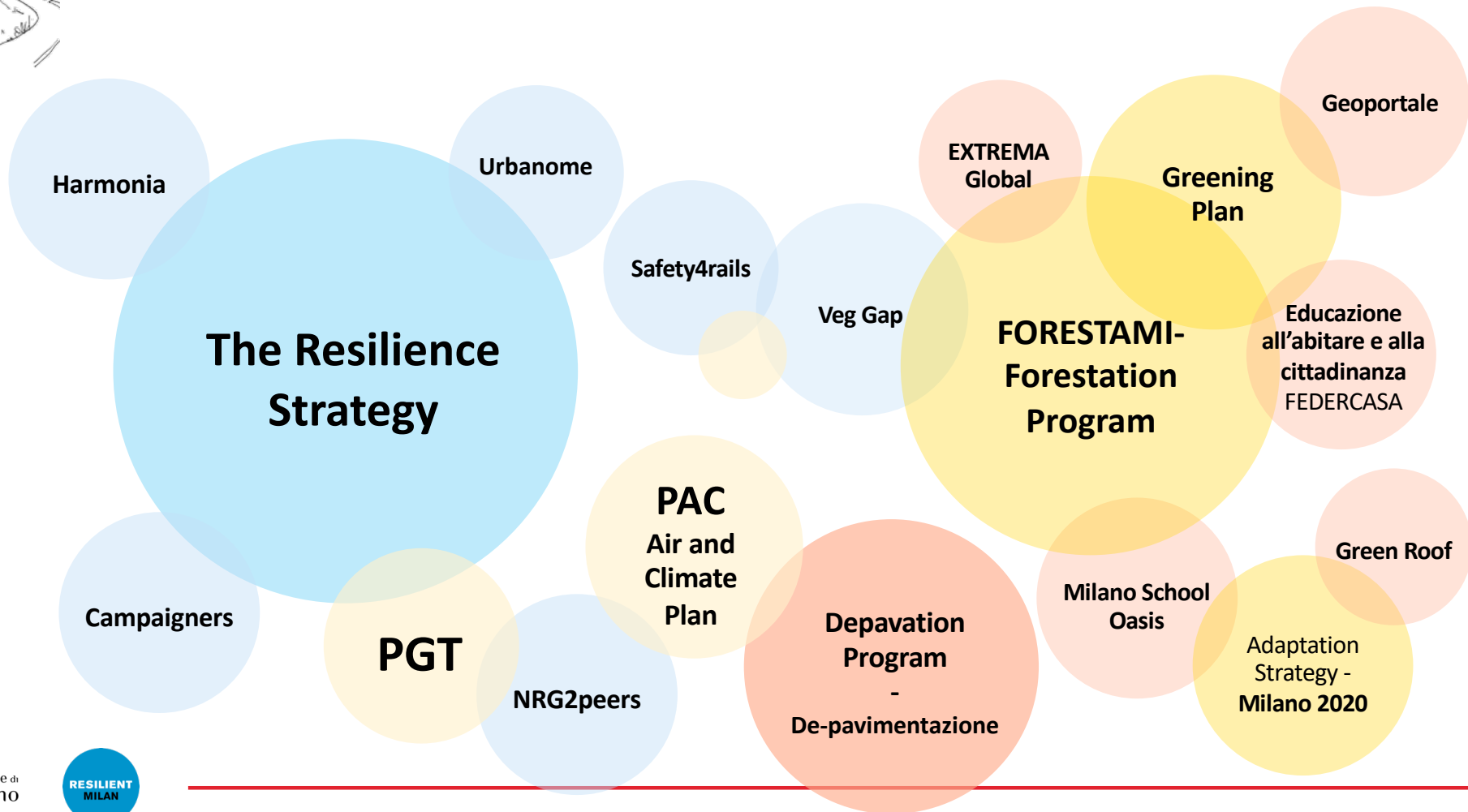
Active Participation

Listening to the **citizens** and their needs that emerged during the epidemic, and their proposals for tomorrow's Milan





Overview on actions, plan and strategies



Water Management in a future Perspective



Water Management is not only about Water

We need innovative solutions out of the silos



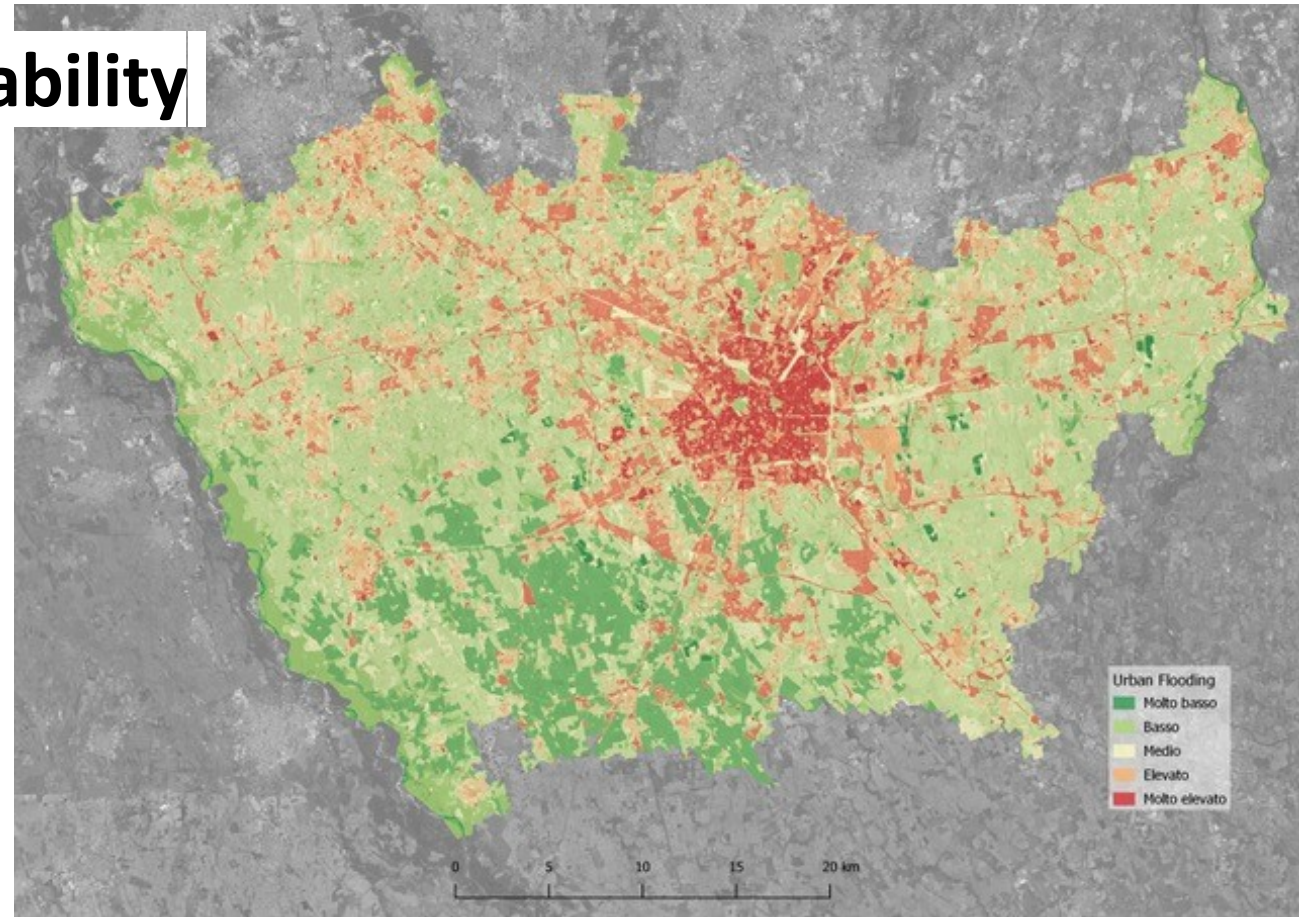
Climate risk and vulnerability analysis

Waterproof city

We need new way of water menaging, Return period is not enough

Climate is changing and extreme weather events are becoming more frequent and stronger

Create Waterproof cities reducing total risk and making the territory **resilient and less vulnerable**.



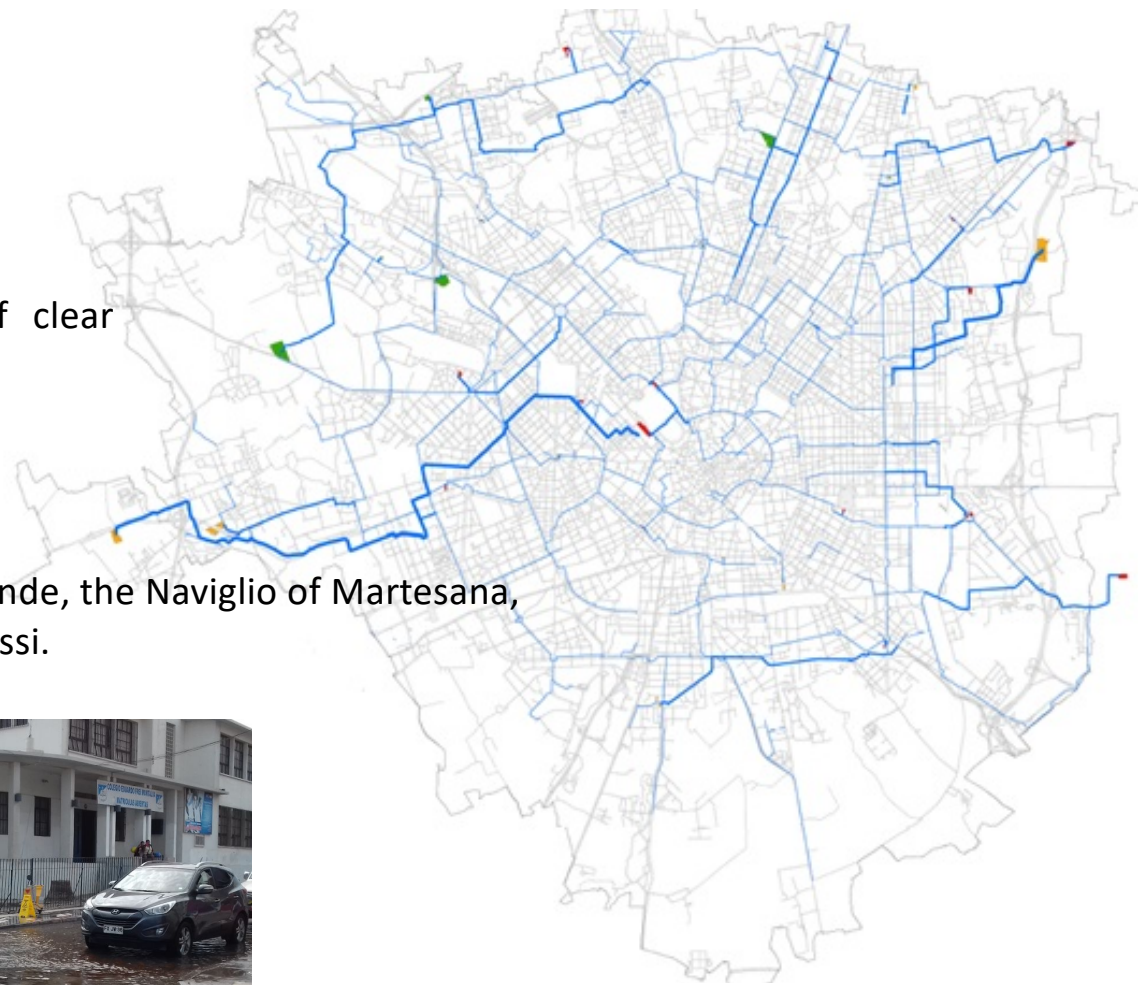
Metropolitan City of Milan, Urban exposure to flooding impact expressed in qualitative classes; elaboration by Denis Maragno and Gianfranco Pozzer (IUAV University, Venice)

— Water in Milan

An Hydrogeological risk Area

The municipality of Milan is located in an area of clear hydraulic/hydrogeological risk.

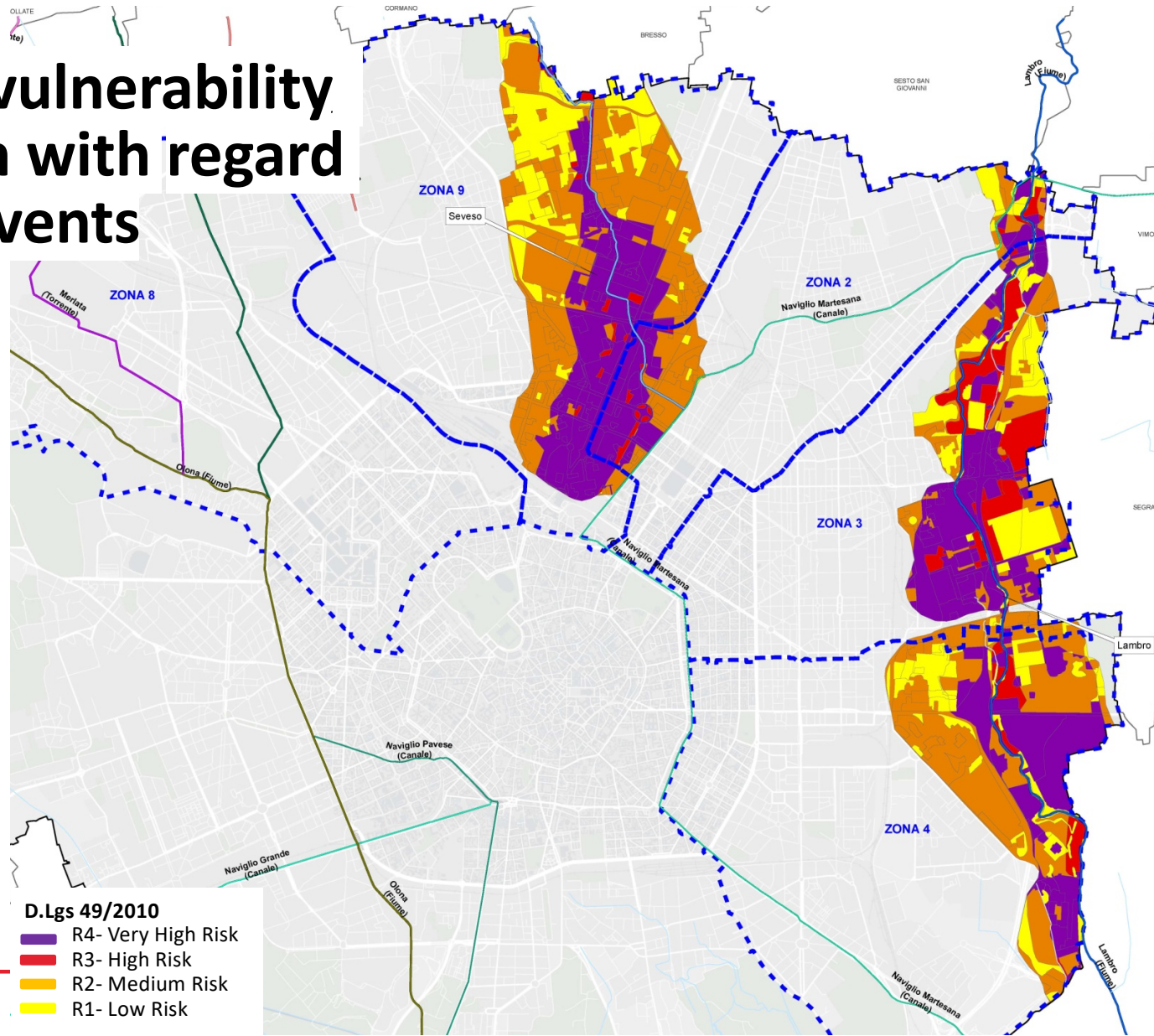
- 3 rivers: **Seveso, Lambro, Olona**
- Several artificial channels such as the Naviglio Grande, the Naviglio of Martesana, the Naviglio Pavese, the Vettabbia and the Redefossi.



Rete principale e impianti acquedotto della Città di Milano.
(Fonte: Tavola 1 del Piano d'Ambito ATO 2014)

Hydrological risk and vulnerability of Milan urban system with regard to extreme weather events

➤ Territorial and socio-economic vulnerability



A photograph of a modern garden courtyard. In the foreground, a large, light-colored wooden bench is positioned on a grassy area. Behind the bench, a large, circular metal archway is covered in climbing yellow flowers. The courtyard is enclosed by a brick building with a corrugated metal roof. The background shows a clear blue sky and some trees. The text "Plans and projects for Milan" is overlaid on the image in white, bold font.

Plans and projects for Milan

PGT MILANO 2030

City Masterplan Milano 2030

A Green, Livable, Resilient City

Milan 2030 wants to give itself a green footprint. To this end, the PGT has downsized land use forecasts for building, thus reducing land consumption.

Water is once again the protagonist, thanks to the **reopening of the Navigli** (canals) and the plans for Lambro and Seveso rivers.

The **green belt** which will connect twenty new city parks eventually becoming the urban threshold of the Metropolitan Park.

New environmental standards favor the reduction of greenhouse gas and carbon emissions and help mitigate climate events



STRATEGIES 5 and 6





strategy 5 MAKE WAY FOR THE ENVIRONMENT

Green and Blue infrastructure

Azioni capillari





-  Ambiti di rigenerazione ambientale
-  Ambiti prioritari drenaggio urbano sostenibile (tramite NBS)

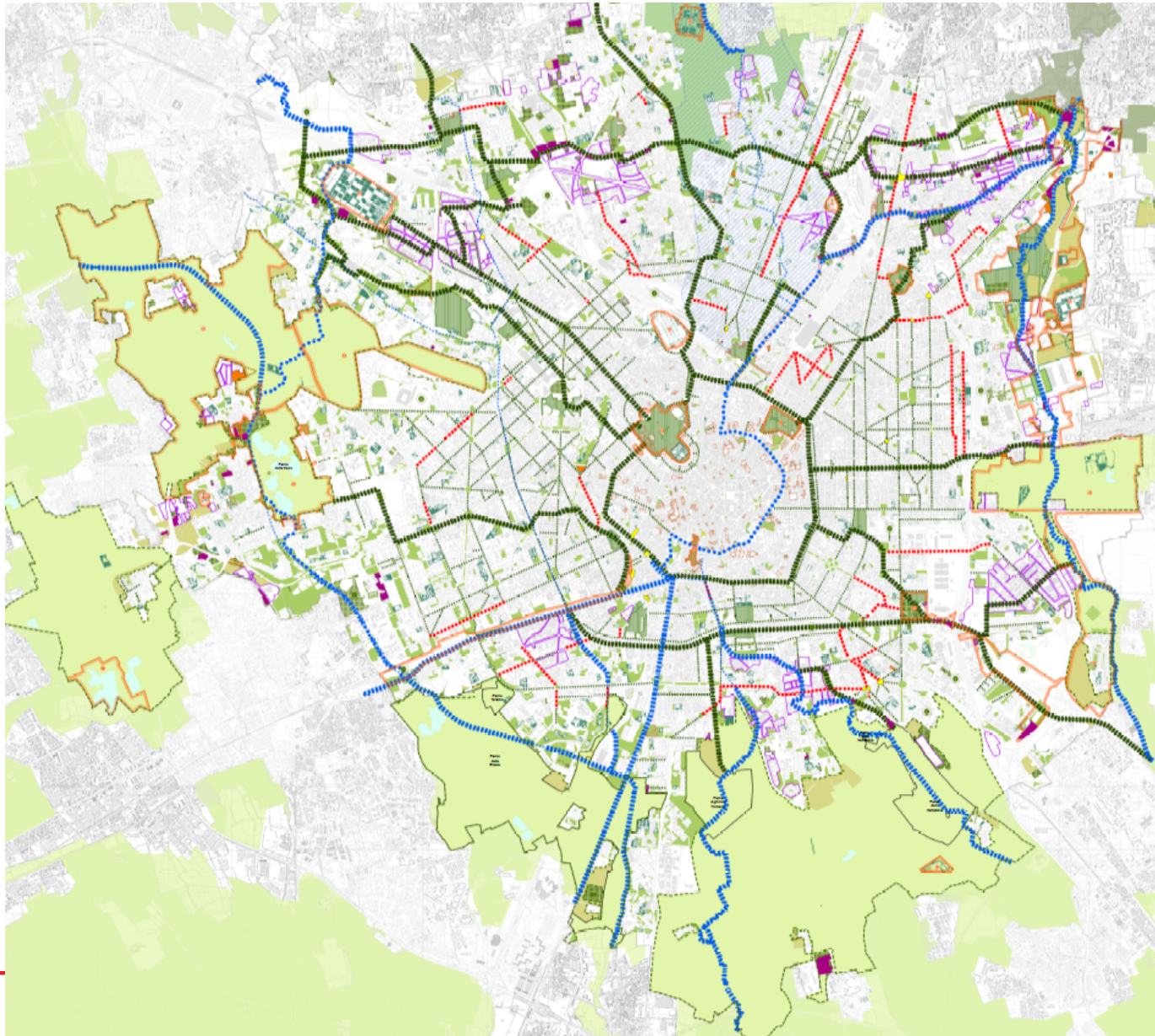
Aree per forestazione/piantumazione

-  Aree pubbliche da forestare/piantumare
-  Spazi per la sosta da depavimentare e piantumare

Aree da depavimentare in parte e piantumare

-  Spazi per la sosta
-  Piazze

-  Connessioni verdi lineari esistenti
-  Connessioni verdi lineari da realizzare
-  Infrastrutture blu
-  Infrastrutture blu - corsi d'acqua tombinati da valorizzare



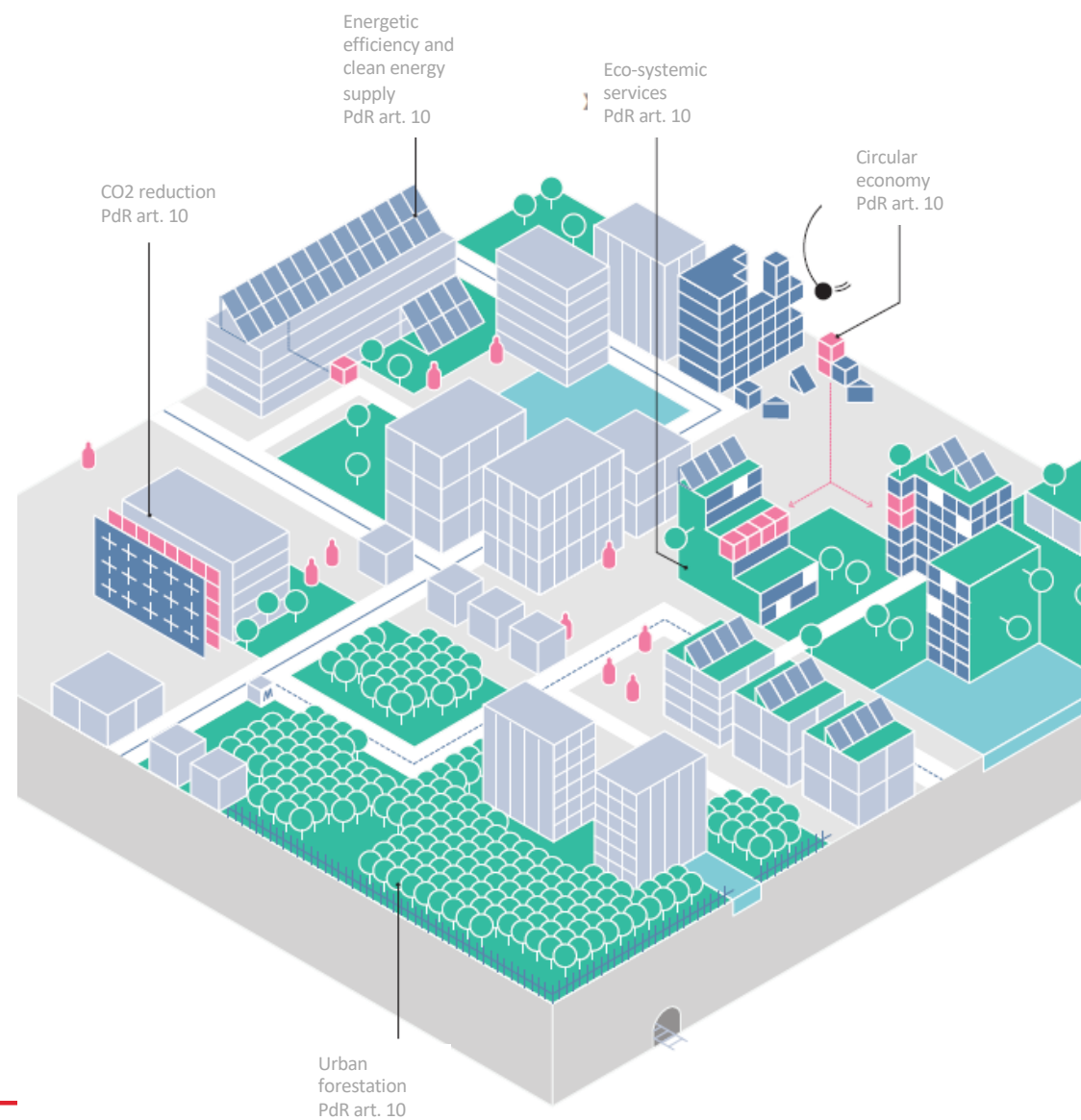
strategy 6

Designing a new ecology

THE STANDARDS OF SUSTAINABILITY

Given the weight of the construction sector in the context of CO2 emissions, measures must concern:

Environmental requirements for new buildings, to minimize energy consumption, **re-naturalize** and **maximize the permeable surface** in the city, to reduce the carbon footprint, both in new buildings and in the regeneration of the building stock.



Waters back to the City

Reopening of The Navigli



The new idea of planning to **prevent hydrogeological risk** make water bodies an **advantage for the city** and brings well-being to the citizens

- More **green and blue areas**
- Temperature **Mitigation**
- **Heating and cooling system**
- offer facilities for sports (canoeing, fishing)
- Enhancement for Real Estate **assets**

Air and climate plan

Focus 1 : Healthy and Inclusive Milan

Focus 2 : Connected and highly accessible Milan

Focus 3 : Positive Energy Milan

Focus 4 : Cool Milan



Focus 5 : Aware Citizens

4.2

Urban cooling and
reduction of the heat
island effect in the city

4.3

Milan
Sponge-City

SuDS

Sustainable Drainage Systems

> SPONGE CITIES

Manage Rainfall in urban areas in order to rebalance hydrological balance, reduce stress on sewers and avoid floods of waters water bodies in which the networks discharge

How to do it?

- Green Rooftops
- De-pavement
- Create permeable pavement

Urbanization and soil sealing have altered the hydraulic performance of urban system, reducing the natural absorption of rainwater by vegetation and soil.

Increasing water volumes deriving from the phenomenon of **urban run-off**, raise the occurrence of flood risk.



— NBS

Nature Based Solutions

Nature-based solutions to address environmental, social and economic challenges in sustainable ways

➤ **copy complex system processes of nature**

store carbon

regulate water flow

reduced disaster risk

improved human well-being and socially inclusive green growth



— Depaving Program

- **DEFINE A GOAL FOR THE DEPAVING PROGRAM** of the city of Milan
- **TO EXPERIMENT INNOVATIVE PROJECTS** of high environmental value, as pilot cases for the city.

Shocks & stress

- Degradation of urban spaces
- floods and inundations
- heat waves
- air and water pollution

Stakeholder

Direzione Generale, Dir. Transizione Ambientale, Dir. Urbanistica, Dir. Quartieri e Municipi, Dir. Mobilità e Trasporti, AMAT

Status

Ongoing



— ForestaMI

Forestry Program

Planting of **3 million trees by 2030** in the metropolitan area.
+5% increase in tree canopy cover
Absorption of **5 million tons of CO2** per year

Shocks & stress

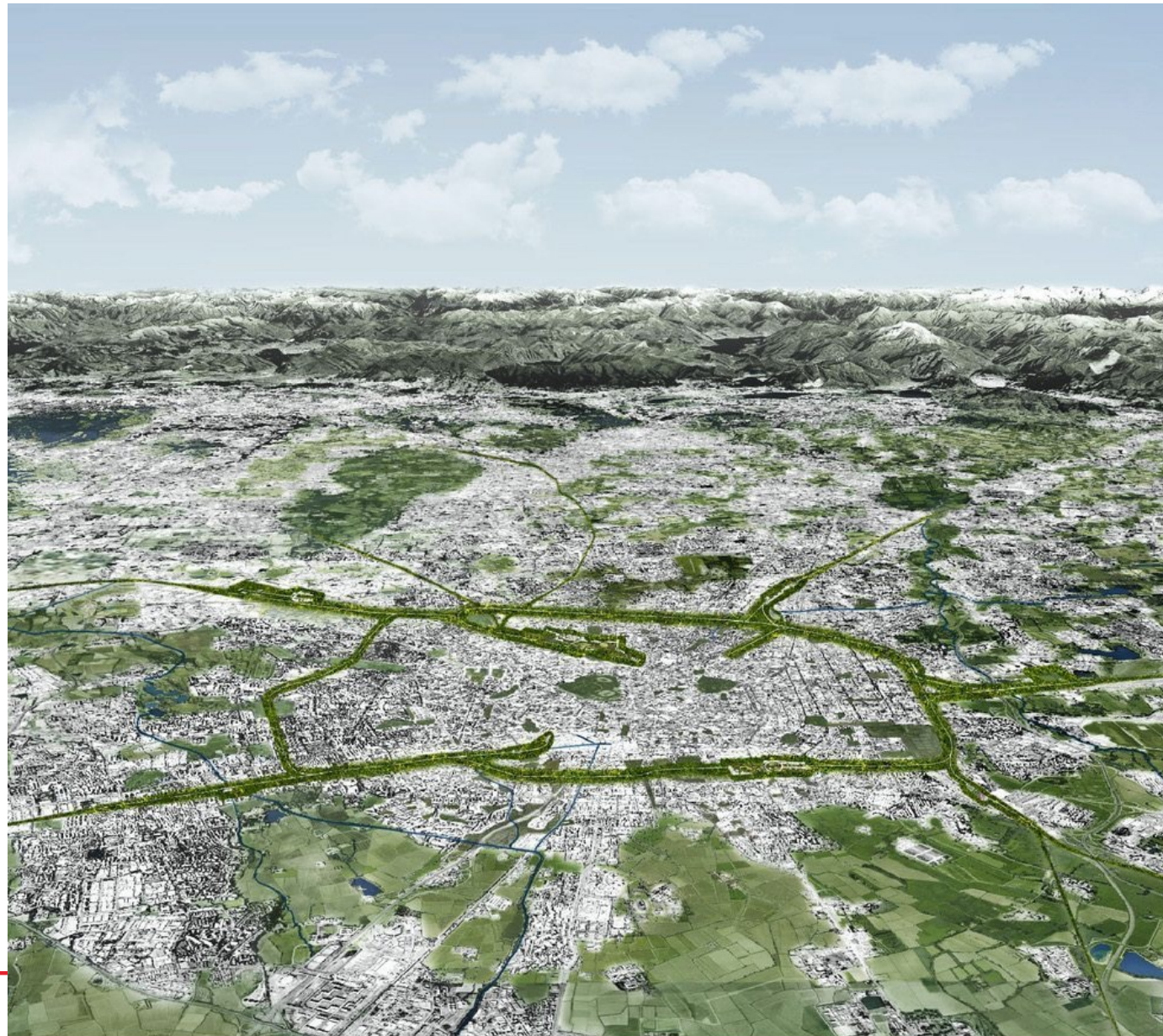
- Air and water pollution
- Heat waves and extreme heat
- Degradation of urban spaces

Memorandum of Understanding between:

Comune di Milano, Città Metropolitana di Milano, Parco Nord, Parco Agricolo Sud, con il coordinamento scientifico del Politecnico di Milano

Status

Ongoing (2018-2030)





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Comune di
Milano

